Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A method of ~~at least partially~~ filling at least one microfluidic ~~channel~~ element of a microfluidic device with a gas or fluid, the method comprising:

placing the microfluidic device in a vacuum chamber;

applying a vacuum to the ~~at least one microfluidic channel of the microfluidic device~~vacuum chamber;

while the microfluidic device remains under vacuum, introducing the gas or fluid into the vacuum chamber such that the microfluidic device is submerged in the gas or fluid;

venting the at least one microfluidic element to the gas or fluid; and

~~at least partially~~ filling the at least one microfluidic ~~channel~~ element with ~~at least one of a~~ the gas or fluid ~~while the at least one microfluidic channel remains under vacuum~~.

2. (canceled)

3. (canceled)

4. (currently amended) The method of claim ~~3~~ 1 wherein applying a vacuum comprises applying a vacuum between about 0 and 102 kPa.

5. (currently amended) The method of claim ~~3~~ 1 wherein applying a vacuum comprises applying a vacuum between about 15 and 85 kPa.

6. (currently amended) The method of claim ~~3~~ 1 wherein applying a vacuum comprises applying a vacuum between about 30 and 70 kPa.

7. (currently amended) The method of claim ~~3~~ 1 wherein applying a vacuum comprises applying a vacuum between about 45 and 55 kPa.

8. (currently amended) The method of claim ~~3~~ 1 wherein applying a vacuum comprises applying a vacuum between about 0 and 5 kPa.

9. (currently amended) The method of claim 1 wherein ~~said at least partially~~ filling the at least one microfluidic element with the gas or fluid comprises ~~at least partially~~ filling the at least one microfluidic channel with a degassed fluid ~~comprising a buffer~~.

10. (currently amended) The method of claim 1 wherein ~~the at least partially~~ filling the at least one microfluidic ~~channel~~ element with ~~a~~ the gas or fluid comprises ~~at least partially~~ filling the at least one microfluidic ~~channel~~ element with at least one fluid selected from ~~the~~ a group ~~comprising:~~ consisting of water, buffer, EDTA solution, DMSO, PEG, polyacrylamide, and NaOH solution.

11. (currently amended) The method of claim 1 wherein ~~said at least partially~~ filling the at least one microfluidic element with the gas or fluid comprises diffusing ~~a~~ the gas or fluid into the at least one microfluidic ~~channel~~ element.

12. (currently amended) The method of claim 1 wherein the at least one microfluidic ~~channel~~ element is fluidly connected to an at least one capillary element, which element includes a capillary channel disposed therein.

13. (currently amended) The method of claim 1 wherein the at least one microfluidic ~~channel~~ element comprises a plurality of microfluidic channels.

14. (original) The method of claim 13 wherein the plurality of microfluidic channels are fluidly coupled to one or more micro-reservoirs.

15. (currently amended) The method of claim 1 wherein ~~the at least partially~~ filling the at least one microfluidic element with the gas or fluid comprises ~~at least partially~~ filling the at least one ~~microchannel~~ microfluidic element with at least one inert gas.

16. (currently amended) The method of claim 15 wherein the at least one inert gas is selected from ~~the~~ a group ~~comprising~~ consisting of carbon dioxide and nitrogen.

17. (currently amended) The method of claim 1 wherein ~~said at least partially~~ filling the at least one microfluidic ~~channel~~ element with the gas or fluid comprises ~~at least partially~~ filling the at least one microfluidic ~~channel~~ element with both a gas and a fluid.

18. (original) A method of preparing at least one microfluidic device for a gas or fluid-filling operation comprising placing the at least one microfluidic device in a vacuum chamber and applying a vacuum to the vacuum chamber.

19. (original) The method of claim 18 comprising placing two or more microfluidic devices in the vacuum chamber.

20. (original) The method of claim 18 further comprising introducing at least one of a gas or a fluid into the vacuum chamber while the at least one microfluidic device remains under vacuum.

21. (original) The method of claim 20 comprising introducing at least one gas and at least one fluid into the vacuum chamber.

22. (original) The method of claim 21 comprising introducing the at least one gas into the vacuum chamber before introducing the at least one fluid into the vacuum chamber.

23. (original) A system for filling a microfluidic device with a gas or a fluid, the system comprising:

a) a chamber configured to receive the microfluidic device;

b) a vacuum source which is fluidly coupled to the chamber and which is configured to apply a vacuum to the chamber; and

c) at least one source of a gas or fluid which is fluidly coupled to the chamber and which is configured to introduce at least one of a gas or a fluid into the chamber.

24. (original) The system of claim 23 wherein the microfluidic device comprises at least one microfluidic channel.

25. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 0 and 102 kPa to the chamber.

26. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 15 and 85 kPa to the chamber.

27. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 30 and 70 kPa to the chamber.

28. (original) The system of claim 23 wherein the vacuum source is applicable to apply a vacuum between about 0 and 5 kPa to the chamber.

29. (original) The system of claim 23 further comprising a detector which is configured to monitor filling of the microfluidic device with the gas or fluid.

30. (original) The system of claim 29 further comprising a processor operably coupled to the microfluidic device, wherein the processor comprises an instruction set for acquiring data from the detector and for controlling filling of the microfluidic device with the gas or the fluid.